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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,732	11/06/2001	David R. Shafer	5589-00807/ebm	9123

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CONLEY ROSE, P.C.
P.O. BOX 684908
AUSTIN, TX 78768

EXAMINER

NGUYEN, THONG Q

ART UNIT PAPER NUMBER

2872

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/005,732

Applicant(s)

SHAHER ET AL.

Examiner

Thong Q. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-40 and 46-51 is/are pending in the application.
- 4a) Of the above claim(s) 46-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 11 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The present Office action is made in response to the amendment (Paper No. 9) of 3/11/2003. It is noted that in the mentioned amendment, applicant has amended claims 21, 29-32, 34, 36-37 and 39 and added a new set of claims, i.e., claims 46-51, into the application. As a result of originally filed and newly-added claims, the pending claims 21-40 and 46-51 are subjected to the following restriction.

Election/Restrictions

2. Newly submitted claims 46-51 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The new claims recite a board band ultraviolet achromatic catadioptric inspection system having an ultraviolet objective configured to correct the primary and residual longitudinal and lateral color over an ultraviolet wavelength band greater than approximately 10 nm. This device as claimed in the newly-added claims is patentable with respect to the device as claimed in the original claims 21-40 by the structure limitations as well as the application. In particular, the device of newly-added claims do not need an objective lens having two lenses of different dispersions; a light source having two different wavelengths, etc.. as recited in the device of the original claims 21-40.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 46-51 have been withdrawn from

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consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Drawings

3. The corrected or substitute drawings were received on 3/11/2003. These drawings are approved by the Examiner.

Specification

4. The lengthy specification which is amended by the amendment of 3/11/2003 has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 21-40 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The device as claimed in claims 21-40 is directed to an optical system having lens elements and reflective elements. There are two examples concerning the data showing the optical characteristics of the optical elements used to constitute the device being disclosed in the specification as can be seen in pages 13-14.

However, the data relating to the optical characteristics of the optical elements disclosed in the lens data contain some questionable problems as follows.

First, regard to the lens data described in page 13, it is not understood why applicant has disclosed that both surfaces (22 and 24) have positive values, i.e., 50.470. Applicant should note that the use of positive sign and negative sign for (lens/mirrored) surfaces of an optical element must be consistent. In other words, if the surface of an optical element having a convex configuration with respect to the direction of the incident light beam is assigned as a positive sign then the surface of an optical element having a concave configuration with respect to the direction of the incident light beam must be assigned as a negative sign. In this aspect, each value of the surface (22) and the surface (23) of the lens data in page 13 should have a negative sign and the value of the surface (24) has a positive sign.

Second, the similar problem concerning the sign of the surfaces is also occurred to the lens data described in page 14 and the data of the reflecting elements described in page 15. In other words, the Examiner is of opinion that 1) each value of the surface (24) and the surface (25) in the lens data of page 14 should have a negative sign and the value of the surface (26) has a positive sign; and 2) since the shape of the reflector (77) has a convex configuration and the shape of the reflector (75) has a concave configuration (see specification page 15, lines 16-19), the value of the reflector (77) should have a positive value and the reflector (75) should have a negative value.

It is noted that the applicant's arguments provided in the amendment (Paper No. 9, pages 10-12) have been fully considered but they are not persuasive. See examiner's opinions provided in the below section thereof "Response to Arguments".

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 21-40, as best as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson (U.S. Patent No. 5,031,977, of record)

Gibson discloses an optical lens system for imaging light in the deep ultraviolet range in an exposure system for copying images/patterns of a reticle to a wafer. The optical lens system comprises two lens elements cemented together wherein the materials of the two lenses are of different dispersions. In other words, one of the lenses is made by fused silica and the other lens is made by lithium fluoride. The lens system as described by Gibson is used in a photolithography system wherein the illuminating light has design wavelengths of 249.8 nm and 243.8 nm (see column 3) for illuminating a reticle which as understood comprises patterns whose material is different from that of the reticle.

With regard to the feature concerning the "objective lens" as recited in claims 21 and 37, such feature is not given a patentable weight because all of the features

recited in the claims are directed to a formation of two lens elements made by different dispersion and there is not any structural limitations in the inspection system being claimed to determine the set of two lens elements are an objective lens of the inspection system.

With regard to the wavelengths of different values as recited in the present claims 25 and 28, and the separation between the two wavelengths as recited in claim 26, such features are not critical to the invention by the mutually exclusive of the values of the wavelengths claimed. For instance, while the wavelengths of the claim 25 are selected from a group consisting of 193 nm, 248 nm and 365 nm then the wavelengths of claim 28 are 313 nm and 220 nm which both are not in the range or the group of wavelengths recited in claim 25. Further, it would have been obvious to one skilled in the art to utilize any kind of light sources whose wavelengths are in the range of deep ultraviolet for an exposure process from a reticle to a wafer using the lens system provided by Gibson to obtain a good resolution due to the different materials of the lens elements.

With regard to the features concerning the scattered light from the objects and the classify of the defects/features between the objects as recited in claims 34, 36, and 39, such features are clearly inherent from the system provided by Gibson without any specific limitations recited in the present claims. In particular, since the reticle comprises different areas and the different areas are illuminated to form images in a wafer; therefore, any scattered light from the reticle will be guide/imaged onto the wafer. The classification of the defects/features of the

different areas of the reticle is also recognized/observed by a user during the process of exposure the reticle to ultraviolet light.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to utilize the teaching provided by Gibson, i.e., the use of different materials for a cemented lens system in an exposure process for transferring patterns on a reticle to a wafer in a device operating with a deep ultraviolet illumination to obtain a good resolution of the image of the reticle on the wafer.

Response to Arguments

9. Regard to the applicant's arguments relating to the rejections of the claims, the examiner offers the following opinions.

A) With regard to the rejection of the claims under 35 USC 112, first paragraph for the reason that the data relating to the optical elements being not consistent, applicant's arguments provided in the amendment (Paper No. 9, pages 10-12) have been fully considered but they are not persuasive. Applicant argued : "Such an assignment of signs...within the system" (Amendment, page 10, last eight lines of the second paragraph). Applicant should note that while applicant has a right to choose a concept or a manner to assign the signs for the optical elements within a system which concept or manner is acceptable to one skilled in the art; however, the concept or manner, when selected, must be consistent for the whole process or for the whole system. For this case, it is unclear to one skilled in the art to find/understand the reason that there are two different and opposite concepts/manners in assignment the signs of

the optical elements in the same table, i.e., Embodiment # 1, located in the same page, i.e., page 13. For instance, applicant has used a first concept/manner for assigning the signs to the elements as can be seen in the first fourteen surfaces: The lens surfaces labeled as 1, 2, 3, 5, 6, 9, 11 and 12 of the lens elements (21, 22, 23, 25 and 27) have convex configuration and have positive signs, and the lens surfaces labeled as 4, 7, 8, 10, 13 and 14 of the mentioned lens elements have concave configuration and have negative signs; and applicant has used different concept/manner for assigning the signs to the surfaces 22 and 24 which surfaces have opposite configurations, i.e., convex verse concave.

It is also noted that applicant has referred to the Patent No. 5,031,976 to support for the applicant's position relating to the assignment of the signs for optical elements. Such a reference is not sufficient to overcome the rejection, and also is not proper as evidence to the rejection. The Examiner in charge of the present application is not responsible for the correctness of any reference not being examined by the same examiner.

B) Regard to the rejection of the claims under 35 USC 103(a) over the art of Gibson, applicant's arguments provided in the amendment (Paper No. 9, pages 12-13) have been fully considered but they are not persuasive. Applicant argues that Gibson does not disclose an inspection system which is configured to detect defects of an object from an image of the object (Amendment, page 12, second paragraph and page 13, second paragraph). The examiner respectfully disagrees with the applicant's opinion and respectfully invited the applicant to review the pending claims and the art of Gibson

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in the light of the reasons provided in the rejection of the Office action. Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections. Applicant has argued that the observation of the defect in the art of Gibson is not produced from the system as in the presently claimed case. The examiner respectfully disagrees with the applicant's opinion because 1) what kind the system does the claim disclose/recite from the language of the claim(s) in the applicant's viewpoint? and 2) since the presently claims do not recite any specific limitations for the system except the recitation that the system is configured to detect defects and the system and the user/observer in the art of Gibson is a system in a general view/status.

C) Regard to the rejection of the claims under 35 USC 103(a) over the art of Gibson and Shafer, applicant's arguments have been fully considered and found persuasive. Thus, the rejection has been withdrawn.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

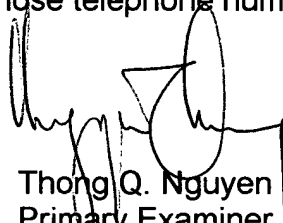
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q. Nguyen whose telephone number is (703) 308-4814. The examiner can normally be reached on M-F.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.



Thong Q. Nguyen
Primary Examiner
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May 29, 2003